Open-Drain Microprocessor Supervisory Circuit in 4-Pin SOT143

Preliminary Technical Information

ADM6315

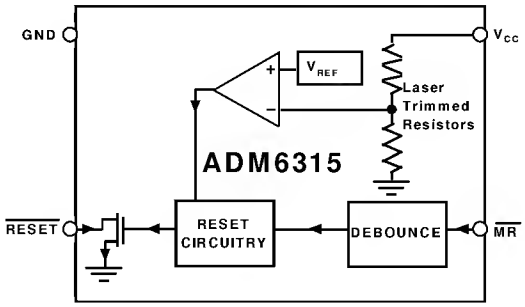
FEATURES

- Superior Upgrade for MAX6315
- Specified Over Temperature
- Low Power Consumption(5µA typical)
- Precision Voltage Monitor of voltages from 2.5V to 5V at 100mV incriments
- Reset Assertion Down to V_{CC}>1 V
- Built-in manual reset
- Pin compatable with the ADM811

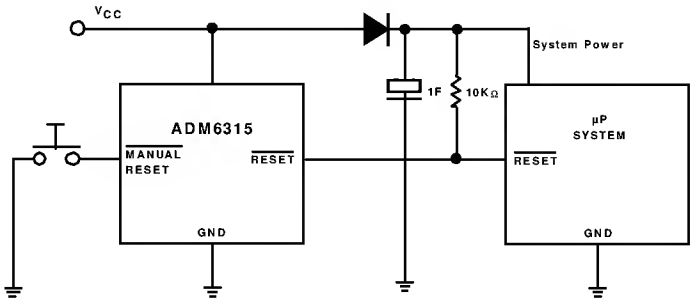
APPLICATIONS

- Microprocessor Systems
- Controllers
- Intelligent Instruments
- Automotive Systems
- Safety Systems
- Portable instruments

FUNCTIONAL BLOCK DIAGRAM



TYPICAL OPERATING CIRCUIT



GENERAL DESCRIPTION

The ADM6315 is a reliable voltage monitoring device which are suitable for use in most voltage monitoring applications.

The ADM6315 is designed to monitor as little as a 1.8% degradation of a power supply voltage. Voltages that can be monitored by the ADM6315 are all voltages (at 100mV incriments) from 2.5V to 5V.

Included in this circuit is a debounced Manual Reset input. Reset can be activated using an ordinary mechanical switch (by pulling MR low), a low input from another digital device or a degredation of the supply voltage. The Manual Reset function is very useful especially if the circuit in which the ADM6315 is operating in, enters into a state that can only be detected by the user. Allowing the user to manually reset a system can reduce the damage or danger that could be otherwise be caused by an out of control or locked-up system.

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(V_{CC} = Full Operating Range, $T_A = T_{MIN}$ to T_{MAX} unless otherwise noted) V_{CC} TYP = 5V

ADM6315–SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Test Conditions/Comments
Supply					
Operating Voltage	1.0		5.5	V	T_A = 0°C to +70°C
V_{cc} Supply Current		5	12	µA	V_{CC}=5.5V (No Load)
		4	10	µA	V_{CC}= 3.6V (No Load)
RESET VOLTAGE THRESHOLD(V_{TH}) [1]					
	V_{TH}-1.8%	V_{TH}	V_{TH}+1.8%	V	T_A = +25°C
	V_{TH}-2.5%		V_{TH}+2.5%	V	T_A = 0°C to +70°C
Reset Threshold Temperature Coef.		60		ppm/°C	
V_{CC} to RESET		35		µs	V_{CC}=Falling at 1mV/µs
Reset Active Timeout Period	1	1.4	2	ms	ADM6315US__D1-T
	20	28	40	ms	ADM6315US__D2-T
	140	200	280	ms	ADM6315US__D3-T
	1120	1570	2240	ms	ADM6315US__D4-T
Manual Reset					
Input Threshold	0.8			V	V_{TH}>4.0V (V_{IL})
			2.4	V	V_{TH}>4.0V (V_{IH})
	0.3xV_{CC}			V	V_{TH}<4.0V (V_{IL})
			0.7xV_{CC}	V	V_{TH}<4.0V (V_{IH})
Minimum Input pulse	1			µs	
Glitch Rejection		100		ns	
To Reset Delay		500		ns	
Pull-Up Resistance	32	63	100	KΩ	
Reset Output					
Output Voltage			0.4	V	V_{CC} > 4.25V, I_{SINK} =3.2mA
			0.3	V	V_{CC} > 2.5V, I_{SINK} =1.2mA
			0.3	V	V_{CC} > 1V, I_{SINK} =80mA
Output Leakage Current			1	µA	V_{CC} > V_{TH}, RESET Deasserted

[1] The ADM6315 is available with preset Reset Threshold values from 2.5V to 5V at 100mV incriments.

ABSOLUTE MAXIMUM RATINGS*

(T_A = +25°C unless otherwise noted)

Terminal Voltage (with respect to ground)

V_{CC} ..... –0.3 V to +6 V
All other inputs ..... –0.3 V to (Vcc + 0.3 V)

Input Current

V_{CC} 20mA

Output Current

RESET 20mA

Power Dissipation (T_A = +70°C),

RT-3 SOT143 (Derate by 4mW/°C above +70°C) ..... 200 mW

θ_{JA} Thermal Impedance ..... 330°C/W

Operating temperature range ..... -40°C to +85°C

Storage temperature range ..... –65°C to +160°C

Lead Temperature (Soldering, 10 secs) ..... +300°C

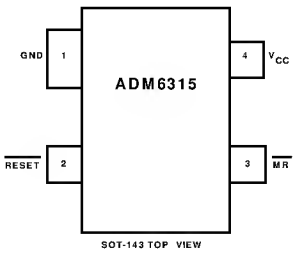
Vapor Phase (60 secs) ..... +215°C

Infrared (15 secs) ..... +220°C

*Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not implied. Exposure to absolute maximum ratings for extended periods of time may affect device reliability.

PIN FUNCTION DESCRIPTION

Pin	Mnemonic	Function
1	GND	0 V. Ground reference for all signals.
2	RESET	Active Low Logic Output. RESET remains low while V_{CC} is below the reset threshold or when MR is low, RESET then remains low for either 1ms (min), 20ms (min), 140ms (min) or 1120ms (min) after V_{CC} rises above the reset threshold
3	MR	Manual Reset. This active low debounced input will ignore input pulses of 100ns or less (typical) and is guaranteed to accept input pulses of greater than 1µs. Leave floating when not used.
4	V_{CC}	Monitored supply voltage.



PIN CONFIGURATION

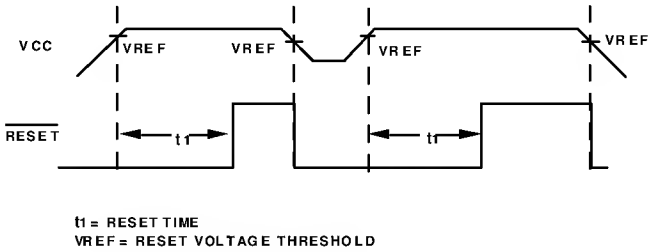


Figure 1. Power Fail Reset Timing

INTERFACING TO OTHER DEVICES

OUTPUT

The ADM6315 series is designed to integrate with as many devices as possible. One feature of the ADM6315 is the RESET open drain output which can sink current from sources with a voltage greater that the ADM6315s Vcc input. making it suitable for use in more diverse applications.

THE BENEFITS OF A VERY ACCURATE RESET THRESHOLD

In other Microprocessor Reset Circuits, tolerances in supply voltages can lead to an overall increase in Reset tolerence levels due to inappropriate power supply levels at the Microprocessor supervisory circuit power supply. Because the ADM6315 series can operate effectively even when there are large degradations of the supply voltages, the possibility of a malfunction during a power failure is greatly reduced. Another advantage of the ADM6315 Series is its very accurate internal voltage reference circuit. Combined, these benifits produce an exceptionally reliable Microprocessor Supervisory Circuit.